

## REMARKS

Claim 20 is amended to correct a spelling error.

### Claim Rejections - 35 USC § 103

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,789,799 to Voinigescu et al. ("Voinigescu") in view of U.S. Patent No. 5,307,512 to Mitzlaff ("Mitzlaff"). Applicant traverses this rejection.

Claim 15 recites two input stages of a specific type that are arranged in a well-defined manner. The examiner's arguments with respect to the prior art are incorrect in terms of (1) what the elements are, and (2) how the elements are arranged.

Claim 15 recites a second class AB input stage. The Examiner alleges that transistors Q3 and Q6 in Fig. 9 of Voinigescu, although not a class AB circuit, still satisfy the requirement of an "input stage." However, the Voinigescu reference does not support this interpretation. Transistors Q3 and Q6 are not an "input stage," but instead are part of a "mixing quad" formed by transistors Q3, Q4, Q5 and Q6. (See col. 14, lines 31-32 of Voinigescu.)

One skilled in the art would not interpret the mixing quad formed by transistors Q3, Q4, Q5 and Q6 (much less the artificial combination of transistors Q3 and Q6 taken alone) as an "input stage" as recited in claim 15. This is born out by the Voinigescu reference itself, which distinguishes between an input stage (see col. 14, lines 29-30 referring to transistors Q1 and Q2 in Fig. 9 as an "input pair") and a mixing quad (see col. 14, lines 31-32). This is also supported by the entirety of Applicant's specification, which consistently distinguishes between a mixer core and an input stage. (See, e.g., page 5, line 27 of the specification referring to the mixer core 24 and input section 26 of Fig. 3.) Thus, Voinigescu does not disclose a second input stage as recited in claim 15. Additional evidence of the conceptual separation of the input stage and mixing core can be found in the article "Low Voltage Performance of a Microwave CMOS Gilbert Cell Mixer", *IEEE Journal of Solid-State Circuits* by P.J. Sullivan, B.A. Xavier and W.H. Ku, Vol. 32, No. 7, July 1997, pp. 1151-1155 (the "Sullivan article") submitted here under an IDS. For example, the Sullivan article refers to an "amplifier section" (page 1151, second column, third line from bottom) and a "mixer core" (page 1152, second column, second line from bottom).

Claim 15 also recites a first class AB input stage coupled to the first and second output terminals and arranged to drive the first and second output terminals responsive to a first input signal. The examiner alleges that transistors Q1 and Q2 in Fig. 9 of Voinigescu

satisfy this limitation. Applicant concedes that transistors Q1 and Q2 form an input stage. However, it is not a class AB input stage, and it is not arranged as recited in claim 15 if one accepts the Examiner's interpretation of the Voinigescu's IF- and IF+ terminals as being the first and second output terminals.

The Examiner acknowledges that Voinigescu does not disclose class AB input stages, but alleges that Mitzlaff provides the motivation to modify Voinigescu to use class AB input stages "for higher efficiency when in FM operation". As discussed above, Voinigescu does not teach two input stages arranged as recited in claim 15, and therefore, cannot serve as a basis for modification according to the teachings of Mitzlaff. Nonetheless, assuming for the sake of argument that the Examiner's analysis of Voinigescu is correct, Mitzlaff does not teach the desirability of using any particular type of input stage. Rather, Mitzlaff simply discloses the benefit of *driving an input stage into saturation* regardless of whether the input stage is class A, class AB, etc. (Col. 2, line 62-66.) Thus, Mitzlaff does not provide any suggestion or motivation to combine the references, and a *prima facie* case of obviousness has not been established.

Allowable Subject Matter

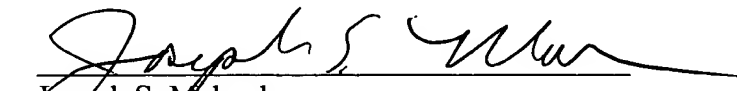
Claims 2, 3, 9, 10, 13 and 16-26 are allowed.

Applicant requests reconsideration in view of the foregoing amendments and remarks. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

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Respectfully submitted,

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